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THE AIR FORCE**

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***Nuclear, Space, Missile, or Command and
Control Operations***

**TACTICAL DATA
LINK PLANNING AND OPERATIONS**

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This publication implements Air Force Policy Directive (AFPD) 13-1, *Command and Control Enterprise*, and is consistent with Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6232.01, *Link 16 Spectrum Deconfliction* and CJCSI 6610.01, *Tactical Data Link Standardization and Interoperability*.” It provides guidance and procedures on Tactical Data Link (TDL) training, planning, and operations throughout the Air Force. It applies to Regular Air Force, Air Force Reserve, and Air National Guard military and civilian personnel at all levels who train, plan, implement, and manage Link 16 and other TDLs that operate independently or integrate into multi-TDL networks. This includes both within the United States and Possessions (US&P) and in theaters of operations outside the US&P. Ensure records generated as a result of processes prescribed in this publication adhere to Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and are disposed of in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force Form 847, *Recommendation for Change of Publication*; route Air Force Forms 847 from the field through the appropriate functional manager’s chain of command to include ACC/A3CJ, acca3cj.tdlomo.allpersonnel@us.af.mil. This publication may be supplemented at any level, but all supplements must be routed to the OPR for coordination prior to certification and approval. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to include ACC/A3CJ,

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SUMMARY OF CHANGES

This document has been substantially revised and needs to be completely reviewed. Major changes include: Tiered Waiver Authorities Compliance Statements, refined responsibilities for commanders, updates to the Wing/Unit Manager and Tactical Data Link Manager (TDLM), addition of a TDL Training Chapter, updates to frequency assignment and deconfliction procedures and numerous edits for accuracy/formatting.

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Chapter 1

INTRODUCTION

1.1. Tactical Data Link Overview. In the *Joint TDL Migration Plan (JTMP)*, Feb 2014, the Department of Defense Chief Information Officer (DoD-CIO) stated “**Tactical Data Links (TDLs) are the primary means of exchanging tactical information between warfighting units today and shall remain so into the future.**” The primary TDL employed by the DoD is Link 16, therefore this Air Force Manual (AFMAN) focuses on Link 16 planning and operations. The United States Air Force (USAF) meets DoD TDL requirements by executing interoperability, management, operations and training for TDL program overview. This manual unifies various planning and operational procedures used by Air Force TDL operators. The information within this manual also prepares the USAF for interoperable exchanges of tactical data through a myriad of weapons, intelligence and command and control (C2) systems. This bridges the seam between operational and tactical echelons and provides integrated, synchronized operations between joint forces and allied partners.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1. Headquarters Air Force Continuity of Operations Branch (AF/A3OA). AF/A3OA shall:

- 2.1.1. Provide policy, guidance and advocacy for TDLs employed by USAF platforms.
- 2.1.2. Provide advocacy for TDL functional areas to include training, operations and maintenance funding, and development of special experience identifiers (SEI).

2.2. Air Combat Command Commander (ACC/CC).

- 2.2.1. ACC/CC is designated as the Air Force service lead command for TDLs.
- 2.2.2. ACC/CC serves as the Tier 1 Waiver Authority for this publication.

2.3. ACC Director of Operations (ACC/A3).

- 2.3.1. ACC/A3 is designated by ACC/CC as the organization responsible for the oversight authority for TDLs.
- 2.3.2. ACC/A3 is delegated as the operational Link 16 network design and management oversight authority.
- 2.3.3. ACC/A3 shall serve as the Tier 2 Waiver Authority for this publication.

2.4. ACC Chief, Command and Control, Intelligence, Surveillance and Reconnaissance Operations Division (ACC/A3C). ACC/A3C is designated as the Air Force lead command responsible for TDLs with emphasis on the Link 16 operational network design and management processes.

2.5. ACC TDL Operations and Management Organization (TDLOMO) / (ACC/A3CJ). ACC/A3CJ shall:

- 2.5.1. Serve as the Air Force's OPR for operational Link 16 network design and management.
- 2.5.2. Provide warfighter support to ensure effective planning and management of operational Link 16.
- 2.5.3. Provide an infrastructure to support TDLs employed on USAF weapon systems and TDLs included in the JTMP.
- 2.5.4. Manage and administer the USAF Link 16 Network Design Facility (NDF).
 - 2.5.4.1. The USAF NDF supports theater commanders' Link 16 requirements for joint, combined, and coalition operations as part of the Joint Network Design Team as defined in CJCSM 3115.03 Vol III, *Joint Data Network Operations: Vol III Joint Interface Control Officer*.
 - 2.5.4.2. Ensure Link 16 network designs are developed, validated, published, managed, and maintained in accordance with USAF, joint, and coalition/combined requirements.

2.5.4.3. Provide technical expertise/on-site support of operational plans during exercises, testing and unit training in order to comply with USAF, joint, and/or coalition interoperability employment, as required.

2.5.4.4. Issue USAF platform initialization data loads (IDLs) directly to users through via the USAF NDF master library.

2.5.4.5. Coordinate with unit TDL points of contact (POC) to define requirements and assist in determining an existing Link 16 network to meet Information Exchange Requirements (IER). If a suitable network does not exist the USAF NDF will formalize the development of a new network design.

2.5.4.6. Act as USAF lead when collaborating IERs with other design facilities (e.g., joint, allied and multi-national).

2.5.5. Perform as Controlling Authority for USAF Link 16, F-22A, F-35A, and Situational Awareness Data Link (SADL) Tactical Users Group cryptographic keys.

2.5.6. Provide web-enabled support for USAF TDL operations.

2.5.7. Represent the Air Force as service lead command for TDL operational and technical issues in service/joint/combined/North Atlantic Treaty Organization (NATO)/bilateral forums that address TDL network management and related issues.

2.5.8. Conduct Air Force Link Network Management Working Group (AFLNMWG) annually, not to exceed a two year period.

2.5.9. Serve as USAF Joint Multi-TDL School (JMTS) Quota Manager.

2.6. The Wing Commander (applicable Commander). Wing Commander shall:

2.6.1. Appoint, in writing, a Wing/Unit Manager and/or TDLM. Any personnel category (military, civilian or contractor with government oversight) may be selected to perform these duties. A copy of the completed appointment letter(s) shall be sent to the TDLOMO for accountability. **(T-3).**

2.6.2. Ensure the Wing/Unit Manager and/or TDLM roles are accomplished. **(T-3).**

2.6.3. Ensure Wing/Unit Manager and/or TDLM receive academic and proficiency training appropriate to the TDL mission and position for which the member has been appointed. **(T-3).** **(NOTE: See Chapter 5 for training guidelines)**

2.7. The Tactical Data Link Manager (TDLM). TDLM shall:

2.7.1. Be responsible for networks supporting operations such as daily training, test and evaluation, and experimentation. Networks may consist of only Link 16 participants or may be part of a larger multi-TDL networks. **(T-3).**

2.7.2. Coordinate, as required, with the Wing/Unit Manager to align TDL operations with unit participants. **(T-3).**

2.7.3. Perform all the responsibilities of a Wing/Unit Manager, as required. **(T-3).**

2.7.4. Coordinate with the appropriate Link 16 deconfliction coordinators to satisfy all frequency assignment authorization restrictions. **(T-0).**

2.7.5. Be in accordance with TDL fundamentals and advanced training as outlined in **Chapter 5**. (T-3).

2.8. The Wing/Unit Manager. Wing/unit manager shall:

2.8.1. Coordinate wing/unit TDL equipment requirements and network selections to meet local mission requirements and act as the interface between the wing and higher-level agencies, such as the Installation Spectrum Manager and TDLOMO. (T-3).

2.8.2. Identify/delegate duties and responsibilities to the Unit-level Manager(s). (T-3).

2.8.3. Coordinate with the Installation Spectrum Manager and/or Major Command (MAJCOM) Spectrum Management Office to ensure TDL platforms/systems are operating in accordance with the frequency assignment. (T-0).

2.8.4. Support TDL cryptographic key functions, to include acquisition, maintenance and terminal fills. (T-3).

2.8.5. Maintain a local TDL network design library accessible by local operations personnel. (T-3).

2.8.6. Ensure exchange of information is protected in accordance with security classification guidelines. (T-3).

2.8.7. Develop a local continuity book in accordance with **Chapter 4**. (T-3).

Chapter 3

TACTICAL DATA LINK OPERATIONS AND MANAGEMENT ORGANIZATION (TDLOMO)

3.1. Overview. The TDLOMO is manned by personnel with technical experience and expertise in USAF TDL operations and cryptographic capabilities. This is required to accurately incorporate operational IERs into the development and management of TDL networks. The primary focus of the TDLOMO shall be the administration of the USAF NDF, which is the sole provider of Link 16 design products and services for both peacetime training and contingency operations within the Air Force. The TDLOMO provides support services to SADL users to ensure interoperability with Link 16 operations. This office addresses other data links comprising the Joint Family of Tactical Data Link Systems and emerging data links as these capabilities are fielded on USAF weapon systems and are integrated into multi-TDL networks. Although Link 16 centric, the TDLOMO will migrate to network design and management support for other operational TDL systems employed by USAF platforms.

3.2. TDLOMO. TDLOMO has been delegated as the service lead command for operational TDL and management with emphasis on Link 16. The TDLOMO is committed to adjudicating and mitigating issues with the goal of fostering interoperability and cross-domain integration solutions to enhance the digital kill chain. Additionally, TDLOMO supports existing and future Air Force requirements for operational validation, publication, management and maintenance of the Link 16 library of network designs.

3.2.1. The USAF NDF master library includes Link 16 networks for all Air Force platforms. The library is a centralized source for Network Description Documents (NDD) and predefined Link 16 IDL files for selection/implementation.

3.2.2. The USAF NDF, and sister services, use the Joint Network Design Aid software tool to develop networks and IDLs. The USAF NDF coordinates with Program Offices to ensure platform terminal parameters are maintained/updated.

3.2.3. Controlling Authorities manage crypto needs to include establishing initial distribution, revalidation and/or change requirements. Cryptographic key material will be administered in accordance with AFMAN 17-1302-O, *Communications Security (COMSEC) Operations*. **(T-3)**.

3.2.4. Joint Multi-TDL School (JMTS) Scheduling. The TDLOMO manages all USAF Multi-TDL training at the JMTS and assists in the identification, development, and planning of continuing education opportunities. **(NOTE:** Reference **Chapter 5** for detailed TDL course information)

3.2.5. The TDLOMO website supports communications feedback and information-sharing between operational commands and units. The website may provide the ability to disseminate platform IDLs to customers and assist in unit TDL continuity book development. This website is accessible through <https://intelshare.intelink.gov/sites/tdlomo/default.aspx>.

3.2.6. Design information for testing, contingency operations and exercises may be classified or contain sensitive information. When documentation of this type is published, it will be available for download on the TDLOMO secure website at: <https://intelshare.intelink.sgov.gov/sites/tlomo/default.aspx>. Classified design information shall be handled, stored, and protected in accordance with its level of classification. **(T-0)**.

3.2.7. The TDLOMO may assist in the development of non-platform-specific Defense Collaboration Services training sessions as requested by the field.

3.2.8. The TDLOMO supports efforts to develop and evaluate Link 16 enhancements and new concepts of link employment and integrate them into network architectures. Subject Matter Expert support for Air Force documents and publications are also included, but not limited to, the Air Force Tactics, Techniques and Procedures 3-1 and 3-3 series.

3.2.9. The AFLNMWG supports the Link 16 network management process for USAF and joint environments. The working group may include topics representative of Link 16 network design, management, and training processes which may be implemented by existing systems, interfaces, and personnel. The AFLNMWG may verify and validate user requirements for network design and management.

3.2.9.1. The TDLOMO branch chief hosts the AFLNMWG, unless delegated. **(T-3)**.

3.2.9.2. The working group may meet within a 12-18 month period; however, the schedule may vary based on the needs of the TDL community. Any participating agency can request the working group to convene more often; if not feasible the duration should not exceed two years.

3.2.9.3. The working group discusses, researches, and assists in the resolution of issues related to Link 16 network management. Topic areas include, but are not limited to, communications security (COMSEC), link 16 spectrum support, TDL network management, training, Wing/Unit Manager, and link 16 enhancements.

3.2.9.4. The AFLNMWG consists of TDL managers as well as other agencies (e.g., Joint Interoperability Division (JID), Network Enabled Weapons System Program Office, etc.) that support the network management process.

Chapter 4

DATA LINK MANAGEMENT

4.1. General. TDLs provide participating platforms/systems the capability of operating together as an integrated force by allowing operators to share tactical information in near real-time. Different levels of planning, coordination, and technical management skills are required to ensure successful operations. There are two types of commander appointed USAF TDL manager positions: Wing/Unit Manager and TDLM. Additionally, a USAF organization may have a TDLM to perform operational network management functions. This document refers to the TDLM as a person fulfilling the functions outlined in **Para 2.7** and does not necessarily refer to a specific crew position in any mission design series. Commanders appoint these individuals to meet the mission's required level of responsibility. **Note:** As detailed in CJCSM 3115.03, and CJCSM 6120.01 *Joint Multi-Tactical Data Link Operating Procedures*, joint operations under the responsibility of a Joint Force Commander are conducted in accordance with an Operation Plan/Operation Order. These multi-TDL network operations fall under the management of a Joint Interface Control Officer (JICO) managing a Joint Interface Control Cell (JICC). Individuals manning the JICCs are normally provided by service C2 facilities and are trained and qualified as Interface Control Officers (ICO), Interface Control Technicians, or equivalent (platform) duty position through their USAF/joint platform's (unit specific) training program. Although TDL training in C2 and Non C2 facilities are not governed by this manual, **Chapter 5** provides guidance for training in data link management core functions.

4.1.1. Wing/Unit Manager appointment letter template can be found on the TDLOMO website <https://intelshare.intelink.gov/sites/tdlomo/default.aspx>.

4.1.2. The TDLOMO website contains tools to be used as a basis for continuing education programs for the Wing/Unit Managers and TDLMs.

4.1.3. Units that do not possess radio frequency (RF) link 16 capability (e.g., platforms, terminals) but still represent a distinct presence (e.g., direct or indirect Precise Participant Location Identification, TDL connectivity) within the TDL interface are required to establish a Wing/Unit Manager. **(T-3)**. Training requirements at a minimum should include an understanding of the capabilities and interoperability requirements of their specific system or platform and how it impacts the overall TDL architecture.

4.2. Wing/Unit Manager. The Wing/Unit Manager performs as the liaison between wing TDL participants and other (internal/external) elements of the operational and testing infrastructure. **Note:** As needed these duties may be assigned or delegated to any level of an organization or TDLM.

4.2.1. Wing/Unit Managers shall possess TDL training, outlined in **Chapter 5** for pre-execution planning and employment requirements for their organization TDL platforms and systems to include mission planning, IERs collection criteria, and spectrum deconfliction for their specific weapon systems/equipment. **(T-2)**. The Wing/Unit Manager will plan and coordinate operations for the TDL(s) for which the member is appointed. **(T-2)**.

4.2.2. The Wing/Unit Manager acts as the network manager for TDL operations by providing the appropriate information required to operate in the TDL network (e.g., instructions/data from the Operations Tasking Link [OPTASKLINK] message) to participants as required. Requirements for networks will be determined and identified to other USAF agencies tasked with providing network support. **(T-2)**.

4.2.3. For operations, training and testing events, the Wing/Unit Manager should review the OPTASKLINK before coordinating with JICO, TDLM, or the USAF NDF. The review is used to determine which TDL networks will be utilized (either existing, modified or new) based on operational requirements. **(T-2)**.

4.2.4. Effective TDL planning requires managers to have access to a standard set of references to support TDL operations. Resources include a library of reference documents, a continuity book, and access to the internet.

4.2.4.1. The TDLOMO website (under the “**Wing Unit Manager (Smart Book)**” tab) contains applicable references, a Smart Book template, and an outline of the minimum topics to be established and tracked in the continuity book.

4.2.4.2. An additional resource for personnel planning TDL operations is to contact ACC, Tactical Data Links Enterprise Division (ACC/A5J). This division compiles the Air Force Tactical Data Link System Capabilities and Limitations repository. The repository provides system TDL information, operational impacts and workarounds for interoperability issues. This will help facilitate successful TDL mission planning and execution.

4.2.4.3. As applicable, the Wing/Unit Manager will consolidate a central library that identifies reference material for subordinate units. **(T-3)**.

4.2.5. When organizations are participating in TDL activity managed by another unit, JICO, or nation (e.g., deployed or Temporary Duty [TDY] location), the Wing/Unit Manager will coordinate to ensure TDL requirements are met. **(T-2)**.

4.2.6. TDL spectrum and deconfliction applies to direct RF link 16 participants only. Radiation of RF link 16 is prohibited unless properly scheduled and deconflicted. For units operating with a RF link 16 terminal on the direct interface. For more guidance on this topic see **Chapter 7** and **Chapter 8**.

4.2.7. Wing/Unit Managers shall consult the appropriate Link 16 Controlling Authority for the utilization plans and order the cryptographic key(s) indicated/chosen for TDLs being operated. **(T-0)**.

4.2.7.1. Cryptographic keys are ordered via Unit COMSEC Responsible Officer and/or the Wing/Base COMSEC office.

4.2.7.2. The Wing/Unit Manager will decide which cryptographic keys to use for testing, local training, and wing exercises. **(T-2)**. For large-scale multi-wing exercises/real-world operations, refer to the appropriate OPTASKLINK message for the appropriate TDL cryptographic key(s). If the wing possesses Network Enabled Weapons, the Wing/Unit Manager will ensure the required weapon key material is available and distributed to the appropriate users. **(T-1)**.

4.2.8. The Wing/Unit Manager should ensure participating units understand, possess and comply with the current OPTASKLINK during the mission.

4.2.8.1. For TDL events where the wing/units are participating in operations or training under the direction of an external JICO or TDL POC, the Wing/Unit Manager will extract data from the (event associated) OPTASKLINK message, as defined in MIL-STD 6040 *U.S. Message Text Format Description*, and provide their unit's platforms/systems with data essential to operating TDLs in compliance with the OPTASKLINK message and their unit's platforms/systems constraints. **(T-2)**. As appropriate, the Wing/Unit Manager will obtain the Identification Sets, IDLs, track numbers, and other appropriate network-specific identifiers as indicated in the appropriate TDL section of the OPTASKLINK. **(T-2)**. As needed, the Wing/Unit Manager will coordinate with the USAF NDF to obtain the unit participant's IDL associated to a generic designed participant.

4.2.8.2. For TDL track producers, the Wing/Unit Manager will align track number blocks with producers as indicated in the appropriate TDL section of the OPTASKLINK. **(T-2)**.

4.2.8.3. The Wing/Unit Manager will determine which unit participants are designated to play special roles, as indicated in the appropriate TDL section of the OPTASKLINK, and will confirm roles that are appropriate to their capabilities. **(T-2)**.

4.2.8.4. The Wing/Unit Manager will extract instructions for activating the network and provide them to expected link participants. **(T-2)**.

4.2.8.5. The Wing/Unit Manager shall align JTIDS Unit/Source Track Number, stacked net usage and other link parameters as indicated in the appropriate TDL section of the OPTASKLINK. **(T-1)**. **Note:** In accordance with CJCSM 6520.01, *Link 16 Joint Key Management Plan*, Link 16 time synchronization by default is based off Coordinated Universal Time. If a command determines network time offset is the only workable solution for mission deconfliction, a waiver must be requested and received from the Joint Staff at js.pentagon.j6.list.dd-c4-cyber-c4t-div-mil@mail.smil.mil. **(T-0)**.

4.2.9. The Wing/Unit Manager will ensure unit TDL operators are knowledgeable of and follow procedures mandated in CJCSM 6120.01. **(T-2)**.

4.2.10. As a stakeholder in TDL operations, Wing/Unit Managers should participate in activities leading to the achievement of the AFLNMWG.

4.3. Tactical Data Link Manager (TDLM). As required, units may employ a TDLM. (Refer to the appropriate weapons system's or support system's directives for the position title, specific training and responsibilities). Examples of Test and Training ranges/organizations employing TDLMs are: Nevada Test and Training Range, 46 Test Squadron, Barry M. Goldwater Air Force Range, 412 Test Wing, and the Utah Test and Training Range.

Chapter 5

TACTICAL DATA LINK (TDL) TRAINING

5.1. General. This chapter provides the guidance necessary to help commanders, operators, and instructors apply TDL training to ensure efficient usage of resources and improve interoperability. The standardized training guidance will aid units in preparing for additional operator responsibilities as a result of expanded TDL employment capabilities and extended interfaces. In addition, this chapter includes advanced training that builds on fundamental training for management and employment of TDL-capable platforms.

5.2. TDL Training. The TDL Training Program provides guidance to commanders on the minimum fundamental tasks for TDL operators. This includes core task requirements, continuation training, advanced course options, SEI assignments, Wing/Unit Manager and TDLM position training. This guidance is not intended to replace existing mission design series TDL training programs. It should be used as a minimum measure when developing new mission design series training programs or enhancing existing TDL training programs.

5.2.1. Knowledge/Performance Standards in [Table 5.1](#) lists the scaled knowledge and performance standards as applied to USAF training. These values are utilized in [Table 5.2](#) and pertain to C2 and Non-C2 TDL operators.

Table 5.1. Knowledge/Performance Standards.

	Scale Value	Definition: The individual:
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (EXTREMELY LIMITED)
	2	Can do most parts of the task. Needs help only on hardest parts. May not meet load demands for speed or accuracy. (PARTIALLY PROFICIENT)
	3	Can do all parts of the task. Needs only a spot check of completed work. Meets minimum load demands for speed and accuracy. (COMPETENT)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (HIGHLY PROFICIENT)
Task Knowledge Levels*	a	Can name parts, tools and simple facts about the task. (NOMENCLATURE)
	b	Can determine step-by-step procedures for doing the task. (PROCEDURES)
	c	Can explain why and when the task must be done and why each step is needed. (OPERATING PRINCIPLES)
	d	Can predict, identify and resolve problems about the task. (ADVANCED THEORY)
Subject Knowledge Levels**	A	Can identify basic facts and terms about the subject. (FACTS)
	B	Can explain relationship of basic facts and state general principles about the subject. (PRINCIPLES)
	C	Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)
	D	Can evaluate conditions and make proper decisions about the subject. (EVALUATIONS)
-Explanations-		
* A task knowledge scale value may be used alone or with a task performance scale to define a level of knowledge for a specific task. (Example: b and 1b)		
** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.		
- A dash indicates training is not required during that phase or, in the case of the Entry column, there is no proficiency assumed upon entry.		

5.2.2. Commanders will ensure TDL qualification programs include specific training that contains, but is not limited to, the tasks listed in **Table 5.2 (T-2)**.

Table 5.2. TDL Fundamentals (Guidelines).

TDL Standards	C2 Units	Non-C2 Units
Interface Control Fundamentals		
TDL references and source documents	A	A
Voice communications	A	A
Applicable TDL equipment for unit platform	B	B
TDL theory and extended interfaces	B	B
Interface Control Team organization	B	A
Interface planning	B	B
Data forwarding	B	-
Information Exchange Requirements	B	B
Network Design	B	A
OPTASKLINK and United States Message Text Format message	B	B
Introduction to networks	B	B
TDL Mission Planning		
Determine requirements for Multi-TDL operations and associated voice communications	1a	1a
Determine and coordinate information exchange requirements with JICO	2b	2b
Extract and interpret pertinent information from the OPTASKLINK	2b	2b
Conduct a TDL mission briefing	2b	2b
* Obtain appropriate Initialization Design Load	2b	2b
* Obtain appropriate cryptographic equipment and keys	2b	2b
* Determine if a temporary frequency authorization is needed	2b	2b
* Perform spectrum deconfliction	2b	2b
** Process a Satellite Access Request (SAT-J or JREAP-A participants)	2b	2b
TDL Mission Execution (If applicable to platform)		
Operate TDL equipment	2b	2b
Configure own site information	2b	2b
Configure Links	2b	2b
Configure Data Forwarding	2b	2b
Configure filters	2b	2b
* Load Cryptographic Material	2b	2b
* Initialize terminal	2b	2b
Operate TDL Radios	2b	2b
Conduct TDL operations	2b	2b
Implement secondary architecture	1a	2b
Conduct post-operation debrief	1a	1a
-Explanations-		
* RF Link 16 participants only		
** Satellite Link 16 participants only		

5.2.3. Training of personnel to effectively perform TDL pre-execution planning and coordination is an ongoing process primarily consisting of local training programs and those provided by the TDLOMO. The goal of training should be to expand the trainee's TDL knowledge base and to ensure the trainee remains up-to-date on new developments in network planning and operations. Units must consider various means of reaching an objective level of knowledge through the use of continuing education. Some tools for consideration include: locally developed refresher training modules, use of computer-based training programs, development of local training guides for specific subject areas, and use of a self-assessment or compliance checklist. (Ref AFI 90-201, *The Air Force Inspection System for Self-Assessment Program Guidelines*). The TDLOMO website contains tools to be used as a basis for continuing education programs for the Wing/Unit Manager and TDLM.

5.2.4. The Joint Interoperability Division (JID) is the DoD's only joint data link training organization and lead authority for operational interface training. The JID, whose mission is to develop and train the warfighter in network advanced data link interoperability concepts and procedures for the CJCS, in order to meet joint and coalition commander's enduring emerging mission needs, is responsible for the JMTS.

5.2.4.1. Certain TDL enabled platforms have a high level of responsibility and influence on the multi-TDL network. To successfully accomplish these responsibilities commanders should select currently qualified and experienced TDL operators to attend advanced TDL training. Courses provided by the JMTS give operators advanced joint training that allows for them to collaborate with other members of the TDL community and fosters interoperability between services. The decision to send TDL operators to advanced training courses depends on the complexity of their mission design series mission, MAJCOM priorities and/or the TDL environment.

5.2.4.2. JMTS courses offered include a web-based training and advanced in-residence courses. The JMTS also has the ability to provide mobile training teams (MTT) to teach at alternate locations. MTT service is coordinated through the TDLOMO upon request and is based on the JID instructors' availability. (see [Table 5.3](#))

5.2.4.2.1. The TDLOMO is the Air Force allocations manager for JMTS courses. Wing/units will submit their training requests to their MAJCOM POC for prioritization before being submitted to the TDLOMO. **(T-2)**. Instructions for applying for these courses are on the TDLOMO website under the "Training" tab.

5.2.4.2.2. The TDLOMO will provide funding for travel (excluding rental vehicles at the TDY location) and per diem for Regular Air Force/civilians/contractors, Air National Guard Title 10 and/or Title 32 and Air Force Reserve Title 10.

5.2.4.2.3. JMTS MTT funding is the responsibility of the requesting unit.

5.2.4.3. SEIs establish qualification and advanced courses accomplished by TDL operators (see [Table 5.3](#)). SEI requirements will be identified in the unit's manpower document and may be included in individual platform's AFIs for those duty positions which require specific or advanced TDL training. **(T-2)**. Commanders who believe their operators require certain SEIs to successfully perform TDL duties must go through proper channels to modify requirements in accordance with AFI 38-101, *Manpower and Organization*. **(T-2)**.

Table 5.3. Basics and Advanced TDL Courses.

Course*	Title	SEIs*	Location	Access
JT-101(1380).	<i>Intro to Multi Tactical Data Link Network Operations Course</i>		Web-Based Training or Moblie Training Team	JID via Joint Knowledge Online
JT-102	<i>Multi Tactical Data Link Advanced Joint Interoperability Course</i>	Enl- 1BB Off- Y8E	JMTS In-residence or Moblie Training Team	USAF JMTS Allocations Manager at ACC/A3CJ
JT-201	<i>Multi Tactical Data Link Planners Course</i>	Enl- 1BC Off- Y8F	JMTS In-residence or Moblie Training Team s	USAF JMTS Allocations Manager at ACC/A3CJ
JT-220	<i>Link 16 Unit Manager Course</i>	Enl- 1BA Off- Y8D	JMTS In-residence or Moblie Training Team	USAF JMTS Allocations Manager at ACC/A3CJ
JT-301	<i>Joint Interface Control Officer Course</i>	Off-Y9B Off- Y8H**	Training Exercise (Location TBD)	USAF JMTS Allocations Manager at ACC/A3CJ
JT-310	<i>Advanced JICC Operators Course</i>	Enl-1BD Off- Y8G	Training Exercise (Location TBD)	USAF JMTS Allocations Manager at ACC/A3CJ
JT-401	<i>Interoperability Executive Course</i>		JMTS In-residence or Moblie Training Team	USAF JMTS Allocations Manager at ACC/A3CJ
<p>* The most current and complete course descriptions and SEIs awarded for each course can be found on the TDLOMO website: https://intelshare.intelink.gov/sites/tldomo/default.aspx under the “Training” Tab, References Link.</p> <p>** SEI Y8H will be awarded to those officers completing this course who have not completed the AOC/ICO course and/or not assigned to an AOC in a JICO billet.</p>				

5.2.5. Wing/Unit Managers will complete the Link 16 Unit Manager (LUM) Course JT-220 offered at the JMTS to obtain a basic level of knowledge and understanding of responsibilities as soon as practical but not later than six months after being appointed. **(T-2)**. The LUM course is not mandatory if the Wing/Unit Manager has previously attended the Multi-TDL Operations Planners Course, JT-201. The TDLOMO will confirm training requirements on a case-by-case basis after notification of appointment. Wing/Unit Managers will obtain additional training, when appropriate, based on the proficiency required for the complexity of the TDL environment the member is assigned to manage. If an appointed individual is unable to complete the LUM course within the prescribed time, the unit operations training officer will notify the TDLOMO in writing, and provide the unit’s plan for completing the training. **(T-2)**.

5.2.6. Training for TDLMs will complete, as a minimum, the JT-102 and the JT-201. **(T-2)**. In addition, if a Unit Manning Document has been identified for SEI Master of Data Link Employment, TDLM shall complete the JT-310 Advanced JICC Operators Course. **(T-2)**. If an appointed TDLM is unable to complete the JT-102 and/or the JT-201 course within six months of appointment, the unit operations training officer will notify the TDLOMO in writing, and provide the unit's plan for completing the training. **(T-2)**.

Chapter 6

REQUESTING LINK 16 NETWORK DESIGN PRODUCTS

6.1. Network Design Requests. The Link 16 request process is located in CJCSM 6120.01. Any unit planning to participate in Link 16 operations/training or testing where a Link 16 network design does not exist or has not been designated may submit a Link 16 design request to ensure operational needs are met. JICOs and TDLMs are the primary interface with the TDLOMO's USAF NDF to initiate the process for network designs.

6.1.1. Prior to requesting a new design, review existing designs for applicability. Users should review the NDD and consider designs that support at least the maximum number and type of participants required, applicability of interface units to other links/TDLs, functional capabilities, connectivity/relay requirements, cryptographic isolation, and pulse density compliance. When an existing design meets the unit's need, download the terminal IDLs for platform participants and the NDD from the TDLOMO website.

6.1.2. Units planning to participate in link 16 operations/training or testing under the direction of a JICO, TDLM or Wing/Unit Manager should identify the design to be used from the link 16 section of the appropriate OPTASKLINK. Changes must be coordinated with the JICO, TDLM or Wing/Unit Manager.

6.1.3. If a new design or a modification to an existing design is required, or if there is uncertainty as to whether an existing design fulfills the requirement, contact the USAF NDF with unit platform requirements as indicated in [Para 6.1](#)

Chapter 7

LINK 16 FREQUENCY ASSIGNMENT

7.1. Background. Link 16 planners and managers must be aware of the complex issues associated with Link 16 equipment operations within the 960 - 1215 Mega Hertz frequency band. The Federal Aviation Administration (FAA) controls the use of this band in the US&P and is responsible for ensuring all link 16 equipment is electromagnetically compatible in accordance with the spectrum certification limits specified in the *Interdepartment Radio Advisory Committee Document 33583/1*. Additionally, CJCSI 6232.01, provides further direction as agreed upon by the FAA and DoD. This band is reserved worldwide for the safe operation of aeronautical radio navigation equipment. Therefore, operations within this band, undergoes considerable scrutiny in regards to flight safety.

7.2. Operations in the United States and Possessions (US&P). Prior to Link 16 operations, each Air Force unit shall verify the following:

7.2.1. Link 16 equipment is listed on a DD Form 1494, *Application for Equipment Frequency Allocation* as detailed in AFI 17-220, *Spectrum Management*.

7.2.2. Approved permanent or temporary frequency assignment for the operating location.

7.2.3. Link 16 activity is scheduled and deconflicted. **(T-1)**. If there is no frequency assignment in place, the unit must obtain a link 16 frequency assignment for the area before link 16 operations can be performed. **(T-1)**. **NOTE:** *Link 16 users will strictly adhere to the restrictions or limitations placed on Link 16 operations specified in the frequency assignment.*

7.2.4. Contact the installation spectrum manager to determine if a frequency assignment exists in the desired area. If a frequency assignment exists, it must be reviewed to ensure platform type and class of terminals meets Time Slot Duty Factor (TSDF) requirements. **(T-1)**. Any operational requirement that exceeds the existing frequency assignment parameters will require a temporary frequency assignment in order to operate. **(T-1)**. If the installation spectrum manager cannot provide the necessary assistance, contact the MAJCOM Spectrum Management Office to determine whether an existing assignment will meet event requirements. **(T-1)**. If a frequency assignment exists that meets mission needs, the Wing/Unit Manager/Deconfliction Coordinator must be contacted to schedule the operation through the Link 16 Pulse Deconfliction Server (LPDS). **(T-1)**.

7.3. Operations Outside the US&P. Prior to use of Link 16 outside the US&P, users must identify, and comply with, host country procedures and restrictions. **(T-1)**. These restrictions and procedures are country-dependent. Guidance for requesting frequency assignments in operating areas outside the US&P can be found in the *JTIDS/Multi-Functional Information Distribution System (MIDS) Spectrum Users Guide*, Chapter 7, and the Link 16 Multinational Ad Hoc Spectrum Support Working Group (MNWG) Notebook found at http://www.link16mnwg.org/eic/site/040.nsf/eng/h_00076.html. Other sources of guidance include: nationally published Frequency Clearance Agreements, Standard Operating Procedures (SOP), and guest force operating procedures. Various nations have established TDL management cells that deconflict and provide authorization to operate on a day-to-day basis.

Chapter 8

LINK 16 DECONFLICTION PROCEDURES

8.1. General. In accordance with the US Spectrum Certification, Interdepartment Radio Advisory Committee Document 33583/1 the DoD must perform Link 16 Deconfliction procedures. CJCSI 6232.01 establishes the requirement to accomplish geographic area deconfliction in order to ensure link 16 usage in the US&P does not exceed pulse density restrictions/TSDF limitations specified by National Telecommunications and Information Administration and subsequent US Military Communications-Electronics Board guidance.

8.2. Link 16 Pulse Deconfliction Server (LPDS). The LPDS is an automated approach to support the deconfliction coordination process. The Deputy Director, Joint Staff, J7 for Joint Force Development provides technical and operational support for pulse density deconfliction through the LPDS. This office provides the LPDS website (<https://lpds.jten.mil/>) to assist with scheduling, coordination, and deconfliction. To safeguard the scheduling information contained in the server database, a log-in is required to access the system.

8.2.1. For routine operations, the Wing/Unit Manager, TDLM, and Deconfliction Coordinator will ensure unit planned activities are input into the LPDS. **(T-1)**. The total number of link 16 pulses for all operations in a geographic area must not exceed the TSDF limitation established. For complex exercises, tests, demonstrations, and special operations outside of routine operations, the planning OPRs will ensure that pulse deconfliction restrictions and procedures are followed. **(T-1)**. These OPRs will confirm that the planned event is properly coordinated with the service-designated coordinator(s) and entered into the LPDS. **(T-1)**. Events should be coordinated during the planning process of the exercise in advance.

8.2.2. In the case of conflicting operations, Wing/Unit Manager, TDLM, and Deconfliction Coordinator will deconflict their operations to ensure compliance with frequency assignments for the area. **(T-1)**.

8.2.2.1. If two or more units are unable to deconflict themselves, operators will coordinate with Joint Staff, J-7 for deconfliction of Link 16 operations. **(T-0)**.

8.2.2.2. Link 16 operations outside US&P may be subject to similar deconfliction procedures specific to theater frequency constraints.

8.3. Link 16 Deconfliction Coordination Procedures. The Wing/Unit Manager or TDLM shall perform or appoint an individual to assist with these duties. The responsible individual for deconfliction coordination must:

8.3.1. Ensure all participating link 16 forces are included in the coordination process and are briefed on specific frequency assignment restrictions. **(T-1)**.

8.3.2. Ensure that entries for link 16 operations within their area of responsibility are entered into the LPDS. **(T-1)**. For operations involving more than one unit, one of the participating units' deconfliction coordinators can be identified as the individual responsible for recording the information in the server for all participants.

8.3.3. Ensure link 16 operations within the frequency assignment authorizations have been coordinated, comply with National Telecommunications and Information Administration restrictions, and do not exceed the geographic area TSDf limits. **(T-1)**.

8.3.4. Coordinate with the Link 16 Wing/Unit Managers or TDLM to satisfy operational requirements for use in their geographical area. **(T-3)**.

8.3.5. Coordinate with local frequency management agencies to obtain current link 16 assignments and restrictions. **(T-0)**.

8.4. Stop/Cease Buzzer. These terms are used as direction to immediately stop radiating RF energy in the TDL frequency spectrum. An agency within the FAA has detected an indication of interference that could affect navigational aids and directs immediate correction.

8.4.1. Every link 16 frequency assignment request must contain a STOP/CEASE BUZZER POC. This is a 24-hour POC within the unit, or other command element in the area who can be contacted when link 16 operations may be in violation of restrictions. **(T-1)**.

8.4.2. The STOP/CEASE BUZZER POC will immediately remedy the situation, if able, and take action to ensure adherence to the restrictions if found to be in violation. **(T-1)**.

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Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 17-220, *Spectrum Management*, 16 March 2017

AFI 33-322, *Records Management and Information Governance Program*, 23 March 2020

AFI 33-360, *Publications and Forms Management*, 1 December 2015

AFI 38-101, *Management and Organization*, 29 August 2019

AFI 90-201, *The Air Force Inspection System*, 20 November 2018,

AFMAN 17-1302-O, *Communications Security, (COMSEC) Operations*, 9 April 2020

CJCSI 6232.01, *Link 16 Spectrum Deconfliction*, 21 September 2012

CJCSI 6610.01, *Tactical Data Link Standardization and Interoperability*, 10 April 2014

CJCSM 3115.01, *Joint Data Network (JDN) Operations, Vol I*, 2 December 2014

CJCSM 3115.03, *Joint Data Network (JDN) Operations, Vol III, Joint Interface Control Officer*, 27 January 2014

CJCSM 6120.01, *Joint Multi Tactical Data Link (TDL) Operating Procedures (JMTOP) Overview*, 9 June 2014

CJCSM 6520.01, *Link 16 Joint Key Management Plan*, 28 April 2015

Department of Defense Chief Information Officer (DoD-CIO) Joint TDL Migration Plan (JTMP), 7 February 2014

Interdepartment Radio Advisory Committee (IRAC) Document 33583/1, 25 March 2004

Joint Tactical Data Link (TDL) Migration Plan (JTMP), Feb 2014

Link 16 Multinational Ad Hoc Spectrum Support Working Group Notebook, January 2016

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

DD Form 1494, *Application for Equipment Frequency Allocation Abbreviations and Acronyms*

Abbreviations and Acronyms

ACC—Air Combat Command

AFI—Air Force Instruction

AFLNMWG—Air Force Link 16 Network Management Working Group

AFMAN—Air Force Manual

AOC—Air Operations Center

C2—Command and Control

CJCSI—Chairman of the Joint Chiefs of Staff Instruction
CJCSM—Chairman of the Joint Chiefs of Staff Manual
COMSEC—Communications Security
DoD—Department of Defense
FAA—Federal Aviation Administration
ICO—Interface Control Officer
IDL—Initialization Data Load
IER—information exchange requirements
JICC—Joint Interface Control Cell
JICO—Joint Interface Control Officer
JID—Joint Interoperability Division
JMTOP—Joint Multi-TDL Operating Procedures (CJCSM 6120.01)
JMTS—Joint Multi-TDL School
JREAP—Joint Range Extension Application Protocol (MIL-STD 3011)
JTIDS—Joint Tactical Information Distribution System
JTMP—Joint Tactical Data Link (TDL) Migration Plan
LPDS—Link 16 Pulse Deconfliction Server
LUM—Link 16 Unit Manager (also known as Wing/Unit Manager)
MAJCOM—Major Command
MIDS—Multifunctional Information Distribution System
MIL STD—Military Standard
MNWG—Link 16 Spectrum Multinational Ad Hoc Spectrum Support Working Group (also known as the Link16 Spectrum Multinational Working Group)
MTT—mobile training team
NDD—Network Description Document
NDF—Network Design Facility
OPR—Office of Primary Responsibility
OPTASKLINK—Operational Tasking Data Links
POC—Point of Contact
RF—radio frequency
SADL—Situation Awareness Data Link
SEI—special experience identifiers
SOP—Standard Operating Procedures

TDL—Tactical Data Link

TDLM—Tactical Data Link Manager

TDLOMO—Tactical Data Link Operations and Management Organization

TSDF—Time Slot Duty Factor

USAF—United States Air Force

US&P—United States and Possessions

Terms

Approval Authority—Senior leader responsible for contributing to and implementing policies and guidance/procedures pertaining to his/her functional area(s) (e.g., heads of functional two-letter offices).

Deconfliction Coordinator—A designated representative of an organization tasked with the scheduling of JTIDS/MIDS operations for their platforms.

Frequency Assignment—Authorization given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions.

Initialization Data Load (IDL)—Platform initialization data files that, in the case of Link 16, contain time slot assignments and standard parameter values fixed for the platform type and, for other TDLs, contain the necessary timing, spectrum control, and addressing assignments used to assure efficient and effective tactical digital communications.

Joint Range Extension Application Protocol (JREAP)—Enables tactical data to be transmitted over digital media and networks not originally designed for tactical data exchange. Formatted tactical digital messages are embedded inside of JREAP messages as data fields within available commercial and Government protocols, such as those used over satellites and terrestrial links.

JTIDS Unit—A unit communicating directly on Link 16.

Link 16 Network Management Process—Link 16 network management process comprises the entire spectrum of actions and functions required to design, plan, establish, and maintain a Link 16 network. Network management comprises four phases over the life cycle of a Link 16 network. These phases are: Network Design, Mission Planning, Network Initialization, and Network Operation.

Operational Tasking Data Links (OPTASKLINK)—The OPTASKLINK message is a formatted message that disseminates the detailed instructions necessary for establishing and maintaining the operational tactical data links in a multi-TDL network/multi-TDL architecture.

Stacked Net—The coordinated use of a specific block of time slots for the same function but on different nets in a Link 16 network design by different communities of users.

Tactical Data Link (TDL)—A Joint Staff-approved, standardized communication link suitable for transmission of digital information. Tactical data links interface two or more command and control or weapons systems via a single or multiple architecture and multiple communications media for exchange of tactical information.

Time Slot Duty Factor (TSDF)—A measure of the aggregate number of pulses transmitted by all Link 16 units within a geographic area. A pulse density of 396,288 pulses per frame is defined as a TSDF of 100%.

Track Number (TN)—The unique numeric or alphanumeric octal identifier associated with a specific set of track data representing a vehicular object, point, line of bearing, fix, or area of probability. As used in source track number

United States and Possessions (US&P)—The term "United States and Possessions" includes the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, and the territories and possessions.